



LAWRENCE
LIVERMORE
NATIONAL
LABORATORY

Progress on the NIF

Edward Moses

October 3, 2005

Progress on the National Ignition Facility
San Jose, CA, United States
January 21, 2006 through January 26, 2006

Disclaimer

This document was prepared as an account of work sponsored by an agency of the United States Government. Neither the United States Government nor the University of California nor any of their employees, makes any warranty, express or implied, or assumes any legal liability or responsibility for the accuracy, completeness, or usefulness of any information, apparatus, product, or process disclosed, or represents that its use would not infringe privately owned rights. Reference herein to any specific commercial product, process, or service by trade name, trademark, manufacturer, or otherwise, does not necessarily constitute or imply its endorsement, recommendation, or favoring by the United States Government or the University of California. The views and opinions of authors expressed herein do not necessarily state or reflect those of the United States Government or the University of California, and shall not be used for advertising or product endorsement purposes.

PROGRESS ON THE NATIONAL IGNITION FACILITY *

Edward I. Moses
Lawrence Livermore National Laboratory
P. O. Box 808
Livermore, CA 94550
Tel 925-423-9624
Ffax: 925-423-5957
e-mail: moses1@llnl.gov

Abstract: The National Ignition Facility (NIF) is a 192 beam Nd-glass laser facility presently under construction at LLNL. When completed, NIF will produce 1.8 MJ, 500 TW of ultraviolet light making it the world's largest and most powerful laser system. NIF will be the world's preeminent facility for performing experiments for Inertial Confinement Fusion (ICF) and High Energy Density Science (HEDS). The Project, begun in 1995, is over 80% complete. The building and the beam path are essentially complete. Nearly all of the functionality of the laser subsystems has been demonstrated. NIF has demonstrated on a single beam basis that it meets its performance goals and shown the laser's precision and flexibility for pulse shaping, pointing, and timing. Beam conditioning techniques, important for target performance, were also demonstrated. The focal spot can be tailored to user specifications using phase plates. Temporal smoothing using smoothing by spectral dispersion (SSD) as well as polarization smoothing was demonstrated. The remaining work is mostly to complete the optics and install them in the beam path and complete the utilities. Presently, eight beams have been activated through the amplifiers and spatial filters to the switchyard wall. Over 150 kJ of 1 ω light has been produced with just 4% of the NIF capacity activated. The Project is scheduled for completion in 2009 and plans have been developed to begin ignition experiments in 2010. This talk will provide NIF status, the plan to complete NIF, and the path to ignition.

* This work was performed under the auspices of the U. S. Department of Energy by the University of California Lawrence Livermore National Laboratory under contract No. W-7405-Eng-48.

Keywords: laser, ignition, experiments, facility